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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/544,226	02/08/2006	Peter Jaenker	056226.56477US	9843

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EXAMINER	
DINH, TIEN QUANG	
ART UNIT	**PAPER NUMBER**
3644	

MAIL DATE	DELIVERY MODE
08/03/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/544,226	JAENKER, PETER	
	Examiner	Art Unit	
	Tien Dinh	3644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-15 and 22-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-15, 22-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 12-15, and 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rinn et al 6045096 in view of Jaenker 6043587.

Rinn et al teaches a deformable aerodynamic member with a front profile area 32, rear profile area (near where 44 is pointing to), and shells 20 disposed on the pressure side and the suction side which converge in a rear profile edge 46 and made out of composite materials. Rinn et al is silent on the use of d33 piezo actuators used on the deformable aerodynamic member to move or change its shape.

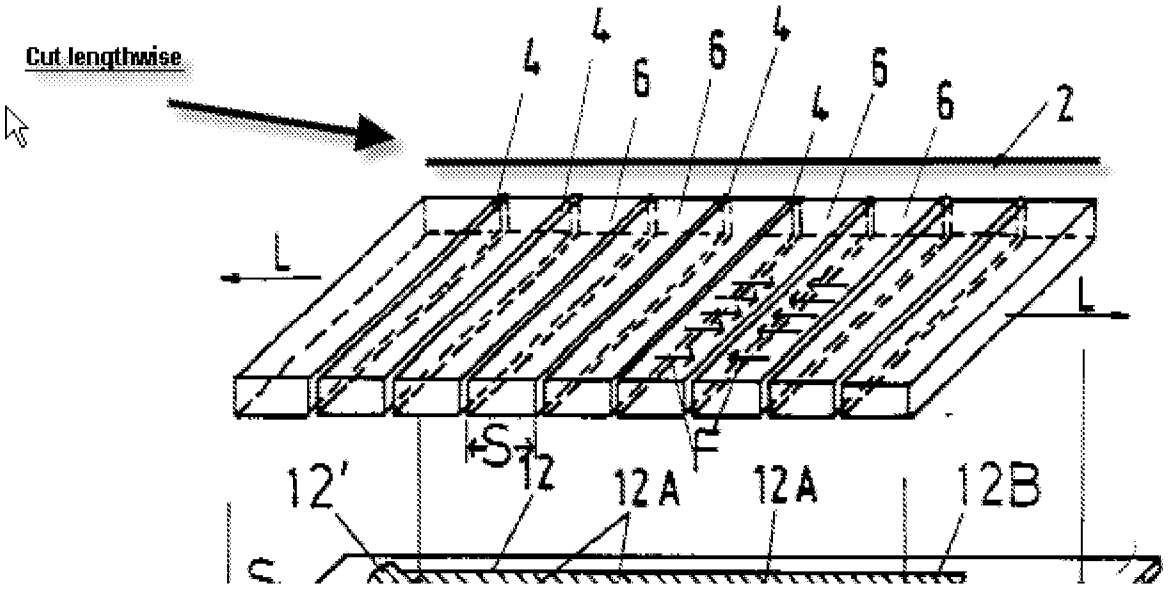
However, Jaenker teaches that d33 piezo actuators are used to actuate a member is well known. See figures 1 and 2. See column 4, lines 15-23 and lines 56-63. See also column 5, lines 7-15.

It would have been obvious to one skilled in the art at the time the invention was made to have used d33 piezo actuators (both on the pressure side and the suction side) in Rinn et al's system as taught by Jaenker to change the shape of his deformable aerodynamic member to control the aerodynamic airflow around it for more control and fuel efficiency.

Re claim 14, Jaenker teaches integration of the piezo actuator into an element it is controlling so this would lead one skilled in the art to integrate the actuators into the shells.

Re claims 23, 25, and 26, the piezo actuators are lamina of d33 pieoelectric material and electrically conducting material arranged in a stacking direction. See Jaenker figures 1 and 2. The electrode layers 4 are formed of an electrically conducting material to produce an electric field. The examiner believes they are alternating lamina but will take official notice also that this is well known and one skilled in the art would have used such arrangements for better control of the piezo actuator. Applicant has not challenged this and is now admitted prior art.

Re claim 24, Jaenker shows that the stack-form elements are cut lengthwise, in a plane parallel to the expansion.



Re claims 27-28, it is a design choice that one skilled in the art would have found it obvious to have made the thickness of 0.5 to 2.5 mm and side edge dimensions of 5 to 60 mm for the actuators to optimize the performance of the actuators to control the shape of the airfoil. Where a claimed improvement on a device or apparatus is no more than "the simple substitution

of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement," the claim is unpatentable under 35 U.S.C. 103(a). Ex Parte Smith, 83 USPQ.2d 1509, 1518-19 (BPAI, 2007) (citing KSR v. Teleflex, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1396 (2007)). Accordingly Applicant claims a combination that only unites old elements with no change in the respective functions of those old elements, and the combination of those elements yields predictable results; absent evidence that the modifications necessary to effect the combination of elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a). Ex Parte Smith, 83 USPQ.2d at 1518-19 (BPAI, 2007) (citing KSR, 127 S.Ct. at 1740, 82 USPQ2d at1396. Accordingly, since the applicant[s] have submitted no persuasive evidence that the combination of the above elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a) because it is no more than the predictable use of prior art elements according to their established functions resulting in the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement.

Furthermore, applicant has not provided any criticality to the dimension of 0.5 to 2.5 mm and side edge dimensions of 5 to 60 mm for the piezo actuators.

Response to Arguments

The examiner would like to point out that the Fard et al reference has been dropped to simplify the rejection.

Applicant's arguments filed 4/2/09 have been fully considered but they are not persuasive. Applicant has argued that since Rinn et al teaches a variable camber airfoil that are manipulated by rods 34, 48, etc., Rinn et al in view of Jaenker does not "replicated the present invention." Applicant further argues that linear expansion or contraction of the skin in Rinn et al therefore plays no role in a deformation mechanism and that any attempt to incorporate the piezoelectric elements into Rinn et al would be fruitless in view of the manner in which it operates. The examiner respectfully disagrees. The examiner must have the broadest, reasonable interpretation of the claims. Claim 12 claimed "d33 piezo actuators". As for the limitation of "for deforming" this is intended use and carries little patentable weight. In addition, claim 12 claimed that the piezo actuators are arranged on the profile member with orientation such that their length changes substantially in the direction of the planes of the shells. Rinn et al clearly shows an airfoil that has a front profile area 32, rear profile area (near where 44 is pointing to), and shells 20 disposed on the pressure side and the suction side which converge in a rear profile edge 46 and made out of composite materials. The shell 20 of Rinn et al is referred to as being "very flexible" or "flexible". See column 3, lines 12-19 and column 4, line 47-51. Since the shell 20 is flexible and is being curved up or down, the material that makes up the shell is capable of being stretch. The d33 piezo electric actuators of Jaenker clearly show that their length changes substantially in a direction. By putting the d33 piezo electric actuators on the shell of Rinn et al, this allows the shell to extend in length, which would influence the air around the shell. This occurs when d33 piezo actuators operate when Rinn et al's parts 34, 48 are not "actuated" at all or are stationary. In addition, the d33 piezo actuators can work in combination

with the structure 34, 48 of Rinn et al since piezo actuators can assist in stretching or curving the shell when structure 34, 48 are used to change the camber of the wing.

Re claim 23, the examiner disagrees with the applicant's arguments that Jaenker fails to show the structure that has a stack of alternating piezo layers and electrode layers. The piezo layers 2 and electrode layers 4 are clearly shown in an alternating, stacked manner.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tien Dinh whose telephone number is 571-272-6899. The examiner can normally be reached on 12-8.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Mansen can be reached on 571-272-6608. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tien Dinh/
Primary Examiner, Art Unit 3644